

AMENDMENTS TO THE CLAIMS

1-10. (Canceled)

11. (Currently amended) An isolated ~~gene~~ nucleic acid encoding an antimicrobial protein having pyranose oxidase activity,

wherein said antimicrobial protein has an amino acid sequence of SEQ ID NO:2, or has ~~50%~~ 80% or more identity with said sequence and has an antimicrobial activity against Rhizoctonia solani or Pyricularia oryzae; or

wherein said protein comprises an amino acid sequence of amino acid residues 76 to 618 of SEQ ID NO:2, or a polypeptide having ~~50%~~ 80% or more identity with said amino acid sequence and having an antimicrobial activity against Rhizoctonia solani or Pyricularia oryzae, ~~or a combination of these polypeptides.~~

12. (Currently amended) The isolated ~~gene~~ nucleic acid according to Claim 11, encoding an antimicrobial protein and having a base sequence of SEQ ID NO:1, or a base sequence which is complementary to a base sequence which hybridizes to SEQ ID NO:1 under stringent conditions of 6 x SSC, ~~45°C to 68°C~~ (without formamide) ~~or 25°C to 50°C (with 50% formamide).~~

13-15. (Cancelled)

16. (Currently amended) The isolated gene nucleic acid according to Claim 11 encoding a protein having antimicrobial activity and having an 80% or more identity with the base sequence of SEQ ID NO:1.

17. (Currently amended) The isolated gene nucleic acid according to Claim 11 encoding a protein having antimicrobial activity and having a 90% or more identity with the base sequence of SEQ ID NO:1.

18. (Currently amended) The isolated gene nucleic acid according to Claim 11 encoding a protein having antimicrobial activity and having a 95% or more identity with the base sequence of SEQ ID NO:1.

19-21. (Cancelled)

22. (Currently Amended) A recombinant vector containing the gene isolated nucleic acid according to Claim 11.

23. (Original) The recombinant vector according to Claim 22 wherein said vector is an expression vector.

24. (Currently Amended) A transformed microorganism ~~transformant~~ obtained by introducing the recombinant vector according to Claim 22 into a host organism.

25-28. (Canceled)

29. (Currently Amended) An isolated ~~gene~~ nucleic acid encoding an antimicrobial protein having pyranose oxidase activity and having a base sequence of SEQ ID NO:1, or a base sequence which is complementary to a base sequence which hybridizes to SEQ ID NO:1 under stringent conditions of 6 x SSC, ~~45°C to 68°C~~ (without formamide) ~~or 25°C to 50°C (with 50% formamide)~~.

30. (Currently Amended) An isolated ~~gene~~ nucleic acid encoding an antimicrobial protein having pyranose activity, wherein said protein can be obtained from a fraction of an aqueous extract of *Lyophyllum shimeji* precipitated by the ammonium sulfate precipitation method, and wherein said protein has an antimicrobial activity at least against *Rhizoctonia solani* or *Pyricularia oryzae*, and shows the presence of components of about 70 kDa and/or about 65 kDa in molecular weight in the SDS-PAGE method.

31. (**Currently Amended**) An isolated gene nucleic acid encoding an antimicrobial protein having pyranose oxidase activity, wherein said protein can be obtained from a fraction of an aqueous extract of *Lyophyllum shimeji* precipitated by the ammonium sulfate precipitation method, and wherein said protein has an antimicrobial activity at least against *Rhizoctonia solani* or *Pyricularia oryzae*, and shows the presence of components of about 70 kDa and/or about 65 kDa in molecular weight in the SDS-PAGE method; and wherein said gene nucleic acid has a base sequence of SEQ ID NO:1 or a base sequence which is complementary to a base sequence which hybridizes to SEQ ID NO:1 under stringent conditions of 6 x SSC, ~~45°C to 68°C~~ (without formamide) ~~or 25°C to 50°C (with 50% formamide)~~.

32. (**Cancelled**)

Please add the following new claims 33-37.

33. (**New**) The isolated nucleic acid according to Claim 11 encoding an antimicrobial protein, wherein said antimicrobial protein has an amino acid sequence of SEQ ID NO:2 or has 90% or more identity with the amino acid sequence of SEQ ID NO:2.

34. **(New)** The isolated nucleic acid according to Claim 11 encoding an antimicrobial protein, wherein said antimicrobial protein has an amino acid sequence of SEQ ID NO:2 or has 95% or more identity with the amino acid sequence of SEQ ID NO:2.

35. **(New)** The isolated nucleic acid according to Claim 11 encoding an antimicrobial protein, wherein said antimicrobial protein has an amino acid sequence of SEQ ID NO:2 or has 80% or more identity with the amino acid sequence of SEQ ID NO:2 by a substitution of one or more amino acids of SEQ ID NO:2, wherein the substitution of one or more amino acids of SEQ ID NO:2 replaces a hydrophobic amino acid with a hydrophobic amino acid, a hydrophilic amino acid with a hydrophilic amino acid, an acidic amino acid with an acidic amino acid or a basic amino acid for a basic amino acid.

36. **(New)** The isolated nucleic acid according to Claim 11 encoding an antimicrobial protein, wherein said antimicrobial protein has an amino acid sequence of SEQ ID NO:2 or has 90% or more identity with the amino acid sequence of SEQ ID NO:2 by a substitution of one or more amino acids of SEQ ID NO:2, wherein the substitution of one or more amino acids of SEQ ID NO:2 replaces a hydrophobic amino acid with a hydrophobic amino acid, a hydrophilic

amino acid with a hydrophilic amino acid, an acidic amino acid with an acidic amino acid or a basic amino acid for a basic amino acid.

37. **(New)** The isolated nucleic acid according to Claim 11 encoding an antimicrobial protein, wherein said antimicrobial protein has an amino acid sequence of SEQ ID NO:2 or has 95% or more identity with the amino acid sequence of SEQ ID NO:2 by a substitution of one or more amino acids of SEQ ID NO:2, wherein the substitution of one or more amino acids of SEQ ID NO:2 replaces a hydrophobic amino acid with a hydrophobic amino acid, a hydrophilic amino acid with a hydrophilic amino acid, an acidic amino acid with an acidic amino acid or a basic amino acid for a basic amino acid.